

Troubleshooting

Chapter Objectives

Chapter 6 provides information to guide the user in trouble shooting the PLC Comm Adapter Board. Included is a listing and description of PLC Comm Adapter Faults. Error Messages, Alarms and logic responses to each.

ATTENTION: Only qualified personnel familiar with the 1336 FORCE drive system and associated machinery should perform troubleshooting or maintenance functions on the drive. Failure to comply may result in personnel injury and/or equipment damage.

Fault and Status LEDs

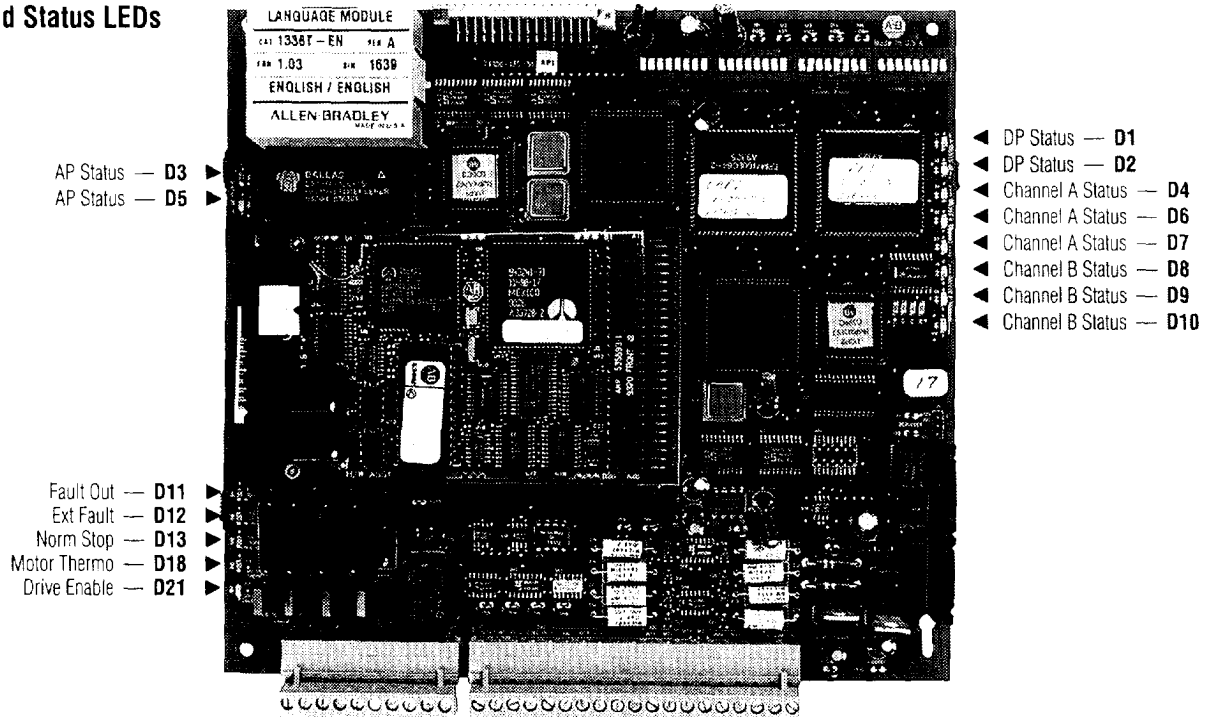


Figure 6-1 — PLC Comm Adapter Board Fault and Status LEDs

(15) Status and Fault LEDs are located on the PLC Comm Adapter Board to provide a visual indication of board operation. The PLC Comm Adapter Board is a non-serviceable device. Improper configuration will cause the PLC Comm Board to indicate faults and/or hardware malfunctions and should be verified first.

Chapter 6

Troubleshooting

Domino Processor (DP) Status D1 and D2

These LEDs reflect the operational status of the PLC Comm Adapter Board DIP switches.

LED	STATE	FUNCTION
D1 (RED)	LED LIT	DP Hard Fault
	LED NOT LIT	D2 On or Hardware Malfunction
	LED BLINKING	OF Soft Fault
D2 (GREEN)	LED LIT	Normal DIP
	LED NOT LIT	D1 On or Hardware Malfunction
	LED BLINKING	DIP Warning

Application Processor (AP) Status D3 and D5

These LEDs reflect the operational status of the application processor.

LED	STATE	FUNCTION
D3 (RED)	LED LIT	AP Hard Fault
	LED NOT LIT	D5 On or Hardware Malfunction
	LED BLINKING	AP Soft Fault
D5 (GREEN)	LED LIT	Normal AP Operation
	LED NOT LIT	D3 On or Hardware Malfunction
	LED BLINKING	AP Warning

CHANNEL A Status D4, D6 and D7 CHANNEL B Status D8, D9 and D10

These LEDs reflect the operational status of either RIO or DH+ communications.

LED	STATE	RIO FUNCTION	DH+ FUNCTION
D4 & D8 (RED)	LED BLINKING	PLC Has Rack Inhibited	Duplicate Node Address on DH+ Link
DIS & D9 (YELLOW)	LED LIT	None	Normal DH+
	LED NOT LIT	None	Communications
	LED BLINKING	None	PLC Comm Adapter
D7 & D10 (GREEN)	LED LIT	Normal PLC Controller Communications	None
	LED NOT LIT	No Communications to PLC Controller	None
	LED BLINKING	PLC Controller is in Reset/Program/Test Mode	None

**PLC Comm Adapter Status
011, D1 2, 013, D1 8 and D21**

These LEDs reflect the operational status of the drive permissives.

LED	STATE	FUNCTION
D11 (RED)	LED LIT	System Fault Present
	LED NOT LIT	System Fault Not Present
012 (RED)	LED LIT	External Fault Present
	LED NOT LIT	External Fault Not Present
013 (RED)	LED LIT	Normal Drive Stop &Signal Present
	LED NOT LIT	Normal Drive Stop Signal Not Present
D18 (RED)	LED LIT	Motor Thermoguard Open
	LED NOT LIT	Motor Thermoguard Closed
D21 (GREEN)	LED LIT	Drive Enable Signal Present
	LED NOT LIT	Drive Disabled

Faults and Fault Queues

The 1336 FORCE monitors both internal and external operating conditions, responding to incorrect conditions as programmed by the user. Most malfunctions that occur will induce one of (2) types of faults.

HARD FAULTS

Hard faults indicate that the 1336 FORCE has detected a malfunction where internal recovery is not possible. Hard faults are the most severe type of faults. Hard faults indicate that a major internal component or system has failed and that drive functions may be lost. When a hard fault occurs, recovery can only be accomplished by issuing a Drive Reset or recycling drive power.

SOFT FAULTS

Soft faults exist to protect drive system components from internal and external malfunctions. Unlike hard faults, in most instances drive control can be maintained. Soft faults indicate that the 1336 FORCE has detected a malfunction that could cause damage to drive control or power components, or the motor. Soft faults may also indicate undesirable external operating conditions. Fault recovery can be accomplished by a clear fault command, clear fault queue, drive reset, or recycling of drive power.

FAULT QUEUE

All faults that have occurred are shown in the fault queue. Each entry shows the type of fault, and is time & date stamped at occurrence. Fault information is maintained in BRAM until it is commanded to be cleared by a Clear Fault Queue command. A Clear Fault command, Drive Reset command, or recycling drive power will not clear the queue. Up to (32) faults may be displayed, each with the following information.

- A fault queue entry number to indicate the position of the fault in the fault queue.
- A trip point (TP) to indicate which entry in the fault queue caused the drive to trip (all faults displayed previous to the TP fault occurred after the TP was logged).
- A (5) character decimal numbered fault code (described on the next page).
- The time and date that the fault occurred.
- Descriptive fault text plus all clear fault commands and when they were executed.

Fault Codes

FAULT TEXT AND CODE DESCRIPTION	ACTION
Adpt BRAM Cksm 24009 (Soft Fault) Discrepancy between calculated and saved checksum for adapter data.	Reset drive. If fault persists, and execute BRAM store, then reset drive and clear faults.
Main BRAM Cksm 24012 (Soft Fault) Discrepancy between calculated and saved checksum for main control board.	Reset drive. If fault persists, execute BRAM store, then reset drive and clear faults.
SW Malfunction 24013 (Hard Fault) Integrity check on board software has failed.	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> .
SW Malfunction 24014 (Hard Fault) Integrity check on board software has failed,	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> .
SW Malfunction 24015 (Hard Fault) Integrity check on board software has failed.	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> .
SW Malfunction 24016 (Hard Fault) Integrity check on board software has failed.	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> .
SW Malfunction 24017 (Hard Fault) Integrity check on board software has failed.	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> ,
SW Malfunction 24018 (Hard Fault) Integrity check on board software has failed.	Reset drive. If fault persists, replace <i>PLC Comm Adapter Board</i> .
AP SW/LM Rev Err 24025 (Soft Fault) PLC Comm Adapter Board software/language module mismatch.	Verify board software and language module versions with A-B.
Adapter Config Err 24026 (Soft Fault) <i>PLC Comm Adapter</i> has detected that board DIP switch settings do not match values stored in BRAM.	Verify DIP switch settings and execute a BRAM store to save the new settings.
No AP LM Exists 25023 The <i>PLC Comm Adapter</i> has detected that a language module has not been installed on <i>Comm Adapter</i> .	Reset drive. If fault persists, replace the language module. the <i>PLC</i>
No AP LM Exists 25023 (Hard Fault) The <i>PLO Comm Adapter</i> has detected that a language module has not been installed on the <i>PLC Comm Adapter</i> .	Reset drive. If fault persists, replace the language module.

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION		ACTION
No MC LM Exists 25024	(Hard Fault) The PLC Comm Adapted has detected that a language module has not been installed on the Main Control Board.	Reset drive. If fault persists, replace the language module.
SB Ptl Timeout 26038	(Warning) Device connected to Port 1 of SCANport has been disconnected.	None
SB Ptl Timeout 26039	(Warning) Device connected to Port 1 of SCANport has been disconnected.	None
SB Pt2 Timeout 26040	(Warning) Device connected to Port 2 of SCANport has been disconnected.	None
SB Pt3 Timeout 26041	(Warning) Device connected to Port 3 of SCANport has been disconnected	None
SB Pt4 Timeout 26042	(Warning) Device connected to Port 4 of SCANport has been disconnected.	None
SB Comm Fault 26043	(Hard Fault) Integrity check on board hardware has failed.	Reset drive, If fault persists, replace PLC Comm Adapter Board.
HW Malfunction 34001	(Hard Fault) Integrity check on board hardware has failed.	Reset drive. If fault persists, replace PLO Comm Adapter Board.
HW Malfunction 34002	(Hard Fault) Integrity check on board hardware has failed.	Reset drive. If fault persists, replace PLO Comm Adapter Board,
HW Malfunction 34003	(Hard Fault) Integrity check on board hardware has failed.	Reset drive If fault persists, replace PLC Comm Adapter Board,
HW Malfunction 34004	(Hard Fault) Integrity check on board hardware has failed.	Reset drive. If fault persists, replace PLO Comm Adapter Board
HW Malfunction 34005	(Hard Fault) Integrity check on board hardware has failed.	Reset drive. If fault persists, replace PLC Comm Adapter Board.

Fault Codes

FAULT TEXT AND CODE DESCRIPTION

ACTION

**ChA Protocol
34006**

(Soft Fault)
PLC Comm Adapter has detected an incorrect protocol DIP switch setting.

Check parameter 303 - DIP Switch ChA and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

CHANNEL A LOW	sw 1	sw 2
RIO w/o Blk Trans	OFF	OFF
RIO w/ Blk Trans	OFF	ON
DH+	ON	OFF
None	ON	ON

**ChB Protocol
34007**

(Soft Fault)
PLC Comm Adapter has detected an incorrect protocol DIP switch setting.

Check parameter 304 - DIP Switch ChB and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

CHANNEL B LOW	sw	sw2
BID w/o Blk Trans	OFF	OFF
RIO w/ Blk Trans	OFF	ON
DH+	ON	OFF
None	ON	ON

**ChA Baud Rate
34008**

(Soft Fault)
PLC Comm Adapter has detected an incorrect Baud rate DIP switch setting.

Check parameter 303 - DIP Switch ChA and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

CHANNEL A LOW	sw 3	sw 4
56.7k Baud	OFF	OFF
115.2k Baud	OFF	ON
230.4k Baud	ON	OFF
None	ON	ON

**ChB Baud Rate
34009**

(Soft Fault)
PLC Comm Adapter has detected an incorrect Baud rate DIP switch setting.

Check parameter 304 - DIP Switch ChB and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

CHANNEL A LOW	sw3	sw 4
56.7k Baud	OFF	OFF
115.2k Baud	OFF	ON
230.4k Baud	ON	OFF
None	ON	ON

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION

ACTION

ChA Rack Rate (Soft Fault)
34010 PLC Comm Adapter has detected an incorrect rack size DIP switch setting.

Check parameter 303 - DIP Switch ChA and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm

<u>CHANNEL A</u>	<u>SW</u>	<u>SW</u>	<u>Not</u>
LOW	5	6	Last <u>Last</u>
1/4 Rack	OFF	OFF	OFF ON
1/2 Rack	OFF	ON	OFF ON
3/4 Rack	ON	OFF	OFF ON
Full Rack	ON	ON	OFF OFF

Note: Full Rack can only have the Last/Not Last switch set to OFF.

ChB Rack Size (Soft Fault)
34011 PLC Comm Adapter has detected an incorrect rack size DIP switch setting.

Check parameter 304 - DIP Switch ChB and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

<u>CHANNEL A</u>	<u>SW</u>	<u>SW</u>	<u>Not</u>
LOW	5	6	Last Last
1/4 Rack	OFF	OFF	OFF ON
1/2 Rack	OFF	ON	OFF ON
3/4 Rack	ON	OFF	OFF ON
Full Rack	ON	ON	OFF OFF

Note: Full Rack can only have the Last/Not Last bit set to 0.

ChA Module Group (Soft Fault)
34012 PLC Comm Adapter has detected a Channel A module group that is not valid for the selected rack size.

Check parameter 303 - DIP Switch ChA and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

<u>CHANNEL A</u>	<u>HIGH</u>	<u>sw 1</u>	<u>sw 2</u>
Module 0		OFF	OFF
Module 2		OFF	ON
Module 4		ON	OFF
Module 6		ON	ON

ChBModuleGroup (Soft Fault)
34013 PLC Comm Adapter has detected a Channel B module group that is not valid for the selected rack size.

Check parameter 304 - DIP Switch ChB and refer to the table below to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

<u>CHANNEL B</u>	<u>HIGH</u>	<u>sw</u>	<u>sw 2</u>
Module 0		OFF	OFF
Module 2		OFF	ON
Module 4		ON	OFF
Module 6		ON	ON

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION

ACTION

Redund Rack Size (Soft Fault)

34014

PLC Comm Adapter has detected different rack sizes for Channels A & B when RIO with redundancy was selected.

Check parameters 303 & 304 DIP Switch ChA & B. Refer to the table below to verify DIP switch settings - Both channels must have the same rack size. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

CHANNELS	SW	SW	NOT
A/B LOW	5	6	LAST LAST
1/4 Rack	OFF	OFF	OFF ON
1/2 Rack	OFF	ON	OFF ON
3/4 Rack	ON	OFF	OFF ON
Full Rack	ON	ON	OFF OFF

Note: Full Rack can only have the Last/Not Last switch set to OFF.

FAULT TEXT AND CODE DESCRIPTION

ACTION

Redund Diff Prot (Soft Fault)

34015

PLC Comm Adapter has detected redundant operation has been called for, but Channel A is not configured for RIO protocol.

Check parameters 303 & 304 DIP Switch ChA & B. Refer to the tables below to verify DIP switch settings - Both channels must be configured for RIO protocol when using the redundant mode. If fault persists, replace PLC Comm Adapter Board.

CHANNEL A LOW	sw 8	
Non-Redundant	OFF	
Redundant	ON	
CHANNEL B LOW	sw 1	sw 2
RIO w/o Blk Trans	OFF	OFF
RIO w/ Blk Trans	OFF	ON
DH+	ON	OFF
None	ON	ON

SW Malfunction (Hard Fault)

34016

Integrity check on board software has failed.

Reset drive. If fault persists, replace PLC Comm Adapter Board.

ChA Dup Nodeaddr (Soft Fault)

36019

PLC Comm Adapter has detected a duplicate Channel A DH+ node address.

Check parameter 303 - DIP Switch ChA and refer to the table in Chapter 7 to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

ChB Dup Nodeaddr (Soft Fault)

36020

PLC Comm Adapter has detected a duplicate Channel B DH+ node address.

Check parameter 304 - DIP Switch ChB and refer to the table in Chapter 7 to verify DIP switch settings. Reset drive. If Fault persists, replace PLC Comm Adapter Board.

Fault Codes (continued)

FAULT TEKT AND CODE DESCRIPTION	ACTION
ChB Dup Nodeaddr (Soft Fault) 36020 PLC Comm Adapter has detected a duplicate Channel B DH+ node	Check parameter 304 - DIP Switch ChB. Refer to the PLC Comm Adapter Board DIP Switch Setting Table in Chapter 7 to verify DIP switch address. Reset drive. If Fault persists, replace PLC Comm Adapter Board.
ChA Comm Loss (warning) 36021 PLC Comm Adapter has detected a loss of Channel A communications with the PLC Controller.	Check for a break in the communications cable. Verify that all connections are intact. Clear fault by issuing a Clear Fault, Drive Reset or recycle power. Check parameter 425 - ChA RIO Fit Sel to determine the drive response to faults. Par 425 is bit coded. Bits i & o determine the fault response to Channel A comm loss. DRIVE FAULT RESPONSE BIT 1 BIT 0 No Response OFF OFF Warning OFF ON Fault Trip ON OFF Check parameter 436 -- ChA Fit Sts. Bit 5 = 1 indicates a fault if configured to do so in parameter 425 - ChA RIO Fit Sel. Check parameter 437 - ChA Warn Sts. Bit 5 = 1 indicates a fault if configured to do so in parameter 426 - ChA RIO Warn Sel.

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION

ACTION

ChA Comm Loss (warning)
36022 PLC Comm Adapter has detected a loss of Channel B communications with the PLC

Check for a break in the communications cable. Verify that all connections are intact. Clear fault by issuing a Clear Fault, Drive Reset or recycle power.
 Check parameter 430 - ChB RIO Fit Sel to determine the drive response to faults. Par 430 is bit coded. Bits 3 & 4 determine the fault response to Channel A comm loss.

DRIVE FAULT		
RESPONSE	BIT 3	BIT 4
No Response	OFF	OFF
Warning	OFF	ON
Fault Trip	ON	OFF

Check parameter 438 - ChB Fit Sts. Bit 5 = 1 indicates a fault if configured to do so in parameter 430 - ChA RIO Fit Sel.
 Check parameter 439 - ChB Warn Sts. Bit 5 = 1 indicates a fault if configured to do so in parameter 430 - ChA RIO Warn Sel.

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION		ACTION
ChA Prg/Res/Test	Description	
36023	PLC Comm Adapter has detected PLC Controller being switched from the run mode to another mode.	<p>Check the PLC mode switch and the I/O control reset. Clear fault by issuing a Clear Fault, Drive Reset or recycle power.</p> <p>Check parameters 425 - ChA RIO Fit Sel and 426 - ChA RIO Warn Sel to determine the drive response to faults. These parameters determine the resolution of the condition, either fault, warning or none. Both parameters are bit coded. Bit 0 determines the resolution to ChA Prg/Res/Test. If bit 0 is set in par 425, a soft fault is logged. If bit 0 is reset in 425 and bit 0 in par 426 is set, a warning fault is logged. If bit 0 is reset in 425 and 426, no action is taken.</p> <p>Bit 1 determines the data output status of a fault. If set to 0, zeros are transmitted. If set to 1, the last state is transmitted.</p> <p>Check Parameter 436 - ChA Fit Sts. Bit 0 = 1 indicates a fault if configured to do so in Parameter 425 - ChA RIO Fit Sel.</p> <p>Check Parameter 437 - ChA Warn Sts. Bit 0 = 1 indicates a fault if configured to do so in Parameter 426 - ChA RIO Warn Sel.</p>

Fault Codes (continued)

FAULT TEXT AND CODE DESCRIPTION

ACTION

ChB Prg/Resfrest 36024	(Warning) PLC Comm Adapter has detected PLC Controller being switched from the run mode to another mode.	Check the PLC mode switch and the 1/0 control reset. Clear fault by issuing a Clear Fault, Drive Reset or recycle power. Check parameters 430 - ChB RIO Fit Sel and 431 - ChB RIO Warn Sel to determine the drive response to faults. These parameters determine the resolution of the condition, either fault, warning or none. Both parameters are bit coded. Bit 0 determines the resolution to ChB Prg/Res/Test. If bit 0 is set in par 430, a soft fault is logged. If bit 0 is reset in 430 and bit 0 in par 426 is set, a warning fault is logged. If bit 0 is reset in 430 and 431, no action is taken. Bit 1 determines the data output status of a fault. If set to 0, zeros are transmitted. It set to 1, the last state is transmitted. Check parameter 438 - ChB Fit Sts. Bit 0 = 1 indicates a fault it configured to do so in parameter 430 - ChB RIO Fit Sel. Check parameter 439 - ChB Warn Sts. Bit 0 = 1 indicates a fault if configured to do so in parameter 431 - ChB RIO Warn Sel.